What is Claimed is:

1. **A non-invasive blood pressure measurement method** comprising the steps of:
   a) keeping the wrist at a posture which can lower the position of the tendons near to the radial artery and cause the radial artery to be close to the radius;
   b) applying a changing external pressure to the radial artery on the wrist;
   c) detecting the change of pulse signal of the radial artery along with the change of said external pressure;
   d) measuring the blood pressure of the radial artery by measuring the external pressure of the radial artery when said pulse signal appearing specifically change.
2. The method as defined in **claim 1,** wherein said step of keeping the wrist at said posture forms an angle between the dorsal side of the wrist and the dorsal side of the hand of 100~170 degrees.
3. The method as defined in **claim 1,** wherein said step of keeping the wrist at said posture forms an angle between the dorsal side of the wrist and the dorsal side of the hand of 100~170 degrees, and synchronously forms a turning angle of the wrist relative to the forearm of 30~100 degrees towards the medial side of body.
4. The method as defined in **claim 1,** wherein said step of keeping the wrist at said posture forms an angle between the dorsal side of the wrist and the dorsal side of the hand of 100~170 degrees, and synchronously forms a deflecting angle from the central line of the hand relative to the central line of the palmal side of the wrist at 10~40 degrees towards the little finger;
5. The method as defined in **claim 1,** wherein said step of keeping the wrist at said posture forms an angle between the dorsal side of the wrist and the dorsal side of the hand of 100~170 degrees, and synchronously forms a turning angle of the wrist relative to the forearm of 30~100 degrees towards the medial side of body, and a deflecting angle from the central line of the hand relative to the central line of the palmal side of the wrist at 10~40 degrees towards the little finger.

6. The method as defined in **claim 1,** wherein said step of detecting the change of the pulse signal of the radial artery is carried out by measuring the variation of said external pressure of the radial artery caused by the pulsation of radial artery in the wrist.

7. The method as defined in **claim 1,** wherein said step of detecting the change of the pulse signal of the radial artery is carried out by measuring the change of volume of the radial artery at a site on the wrist that is within the pressure area of external pressure.

8. The method as defined in **claim 1,** wherein said step of detecting the change of the pulse signal of radial artery is carried out by measuring the change of volume of radial artery at a plurality of sites on the wrist that are within the pressure area of external pressure, and selecting one optimal measuring site, and then outputting the optimal pulse signal by using the volume change of the pulse signal measured at said optimal site.

9. The method as defined in **claim 8,** wherein there are at least 2 columns and 2 lines of measuring sites along directions that are parallel and vertical to the radial artery respectively; said step of selecting one optimal measuring site comprising the steps of:

a) selecting a column of measuring sites from all columns of measuring sites, where the pulse signal detected possess the maximum oscillation during the change of the bladder pressure within the range between a lower limit below the possible mean blood pressure and an upper limit above the possible systolic blood pressure of the subject, the amplitude during the maximum oscillation being the largest comparing with the amplitude of the pulse signal detected from other columns of measuring sites;

b) selecting an optimal site from the selected column of measuring sites, where the pulse signal detected possesses an amplitude close to disappearance during bladder pressure which is higher than the pressure corresponding to the maximum amplitude of the pulse signal, and the bladder pressures corresponding to the maximum and the disappearance of the pulse signal detected at the site are

the lowest compared with the bladder pressures corresponding to the maximum and the disappearance of the pulse signal detected at other sites of the selected column of measuring sites.

10. The method as defined in **claim 8,** wherein the position of the optimal site in the pressure area of the pressure bladder is displayed visually, and the position of the bladder is adjusted according to the display so that the optimal site is positioned in the center of the pressure bladder.

11. The method as defined in **claim 8,** wherein an automatic check is carried out to make sure that the optimal site is in the center of the pressure bladder, such that if the optimal site shifts away from the center of the pressure bladder, a warning signal is given so as to prompt an operator to readjust the position of the pressure bladder.

12. The method as defined in **claim 1,** wherein said step of measuring the blood pressure of the radial artery is carried out according to the oscillometric method to intermittently measure the mean blood pressure, systolic blood pressure and diastolic blood pressure of the radial artery.

13. The method as defined in **claim 1,** wherein said step of measuring the blood pressure of the radial artery is carried out according to the process of the vascular unloading method to continuously measure the instantaneous blood pressure of the radial artery.

14. The method as defined in **claim 1,** wherein said step of measuring the blood pressure of the radial artery is exchargeably carried out either according to the process of oscillometric method to intermittently measure the mean blood pressure, systolic blood pressure and diastolic blood pressure, or according to the process of the vascular unloading method to continuously measure the instantaneous blood pressure of radial artery.

15. The method as defined in **claim 1,** wherein said step of applying changing external pressure to the radial artery, and said step of detecting the change of pulse signal of the radial artery so as to measure the blood pressure of the radial artery, can be switched to become applying changing external pressure to the ulnar artery, and

detecting the change of pulse signal of the ulnar artery so as to measure the blood pressure of the ulnar artery.

16. The method as defined in **claim 15,** further comprising using the results of the blood pressure measurement of the radial artery to calibrate the results of blood pressure measurement of the ulnar artery.

17. **A non-invasive blood pressure measurement apparatus** comprising:

a) a wrist holding device for keeping the wrist at a posture which can lower the position of the tendons near to the radial artery and cause the radial artery to be close to the radius;

b) a pressure bladder for applying external pressure to the radial artery on the wrist, and a pressure bladder holding device for retaining the position of said pressure bladder relative to the radial artery unchanged;

c) a pulse transducer for detecting the pulse signal of radial artery; and

d) a pressure feeding-measuring system connected to said pressure bladder and said pulse transducer; said pressure feeding-measuring system includes, at least, a pressure feeding device for feeding the pressure to said pressure bladder, and a signal processing device for processing the detected pulse signal of the radial artery and controlling said pressure feeding device, so as to measure the blood pressure of the radial artery by measuring the external pressure of the radial artery when the detected pulse signal of the radial artery changes.

18. The apparatus as defined in **claim 17,** wherein said wrist holding device is a curved board made of material with high rigidity, its length and width covering at least the dorsal side of the hand, the dorsal side of the wrist joint, the dorsal side of the wrist, and the dorsal side of the forearm close to the elbow.

19. The apparatus as defined in **claim 18,** wherein the shape of said curved board forms an angle between the dorsal side of the wrist and the dorsal side of the hand of between 100~170 degrees, and forms a turning angle of the wrist relative to the forearm of between 30~100 degrees towards the medial side of body, and also forms a deflecting angle from the central line of the hand relative to the central line of the palmal side of the wrist at 10~40 degrees towards the little finger.

20. The apparatus as defined in **claim 18,** wherein the thickness of said curved board is increased in the part covering the dorsal side of the wrist joint, so as to eliminate the difference between the diameters of the wrist joint section and that of the middle part of the forearm, and to fill the sinking surface of the dorsal side of wrist joint part due to the hand bending to a regular column surface.

21. The apparatus as defined in **claim 17,** wherein said pressure bladder and said bladder holding device are integrated into a whole, to form a strap embedded with said pressure bladder; said strap is made of a resilient material, and shaped in to a ring-shape, the diameter of which is similar to that of the wrist, and two ends of an opening of said strap opened at the back side of the wrist are connected by non-extensible means; the wall of said pressure bladder which closes to the wrist is made with a resilient membrane shaped to upheave towards the wrist.

22. The apparatus as defined in **claim 17,** wherein said pulse transducer for detecting the pulse signal of the radial artery is a pressure transducer, the pressure sensing surface is connected to said pressure bladder by air or liquid.

23. The apparatus as defined in **claim 17,** wherein said pulse transducer for detecting the pulse signal of the radial artery is a volume transducer; said volume transducer being a reflective photoelectric transducer that consists of at least one light emitting device and at least one photoelectric device, said light emitting device and said photoelectric device are arranged vertical to the radial artery, the midpoint of the two kinds of devices corresponds to the center of said bladder wall, and the two kinds of devices are fixed on the inside of the wall of said pressure bladder which closes to the wrist.

24. The apparatus as defined in **claim 17,** wherein said pulse transducer for detecting the pulse signal of the radial artery is a volume transducer array; said volume transducer array is preferably the reflective photoelectric transducer array that consists of many light emitting devices and many photoelectric devices which output the independent pulse signals respectively, there are at least two photoelectric devices arranged both parallel to and vertical to the radial artery respectively in the array, said light emitting devices are arranged around the

photoelectric device array; the center of said array corresponds to the center of said bladder wall, and the two kinds of devices are fixed on the inside of the wall of said pressure bladder which closes to the wrist; each output of the photoelectric devices of the array are respectively connected to the corresponding input of an optimal site selector to select the optimal measuring site.

25. The apparatus as defined in **claim 24,** wherein said optimal site selector selects the optimal measuring site according to the steps of:

a) selecting a column of transducers from all columns of transducers, in which the pulse signal detected possesses the maximum oscillation during the change of bladder pressure, and the amplitude during the maximum oscillation is the largest compared with the amplitude of the pulse signal detected from other column of transducers;

b) selecting an optimal transducer from the selected column of transducers which detected the pulse signal possessing an amplitude close to disappearance which the bladder pressure is higher than the pressure corresponding to the maximum amplitude of the pulse signal, and the bladder pressures corresponding to the maximum and the disappearance of the pulse signal detected at the transducer are the lowest compared with the bladder pressures corresponding to the maximum and the disappearance of the pulse signal detected by other transducers of the selected column of transducers.

26. The apparatus as defined in **claim 24,** further comprising an optimal site displaying device, wherein said optimal site displaying device is controlled to indicate the exact position of the optimal site in said pressure bladder wall facing the wrist.

27. The apparatus as defined in **claim 24,** further comprising an optimal site warning device to issue warning signals when the optimal site shifts away from the center of said pressure bladder wall facing the wrist.

28. The apparatus as defined in **claim 17,** wherein said pressure feeding-measuring system comprises the pressure feeding device and the signal processing device used for intermittently measuring the mean blood pressure, systolic blood pressure

and diastolic blood pressure of radial artery according to the process of the oscillometric method.

29. The apparatus as defined in **claim 17,** wherein said pressure feeding-measuring system comprises the pressure feeding device and the signal processing device used for continuously measuring the instantaneous blood pressure of the radial artery according to the process of the vascular unloading method.

30. The apparatus as defined in **claim 17,** wherein said pressure feeding-measuring system comprises the pressure feeding device and the signal processing device used for both intermittently measuring the mean blood pressure, systolic blood pressure and diastolic blood pressure of radial artery according to the process of the oscillometric method, and continuously measuring the instantaneous blood pressure of the radial artery according to the process of the vascular unloading method, said apparatus also comprising a switching device to switch the connection of said pressure feeding device and said signal processing device according to the requisition of blood pressure measurement.

31. The apparatus as defined in **claim 17,** further comprising a pressure bladder for applying external pressure to the ulnar artery that may be placed on the wrist skin over the ulnar artery, a pulse transducer for detecting the pulse signal of ulnar artery, and a switching device for switching the two pressure bladders and pulse transducers to measure either radial arterial blood pressure or radial arterial blood pressure.

32. The apparatus as defined in **claim 17,** further comprising a calibrating device for using the results of radial arterial blood pressure to calibrate the results of radial arterial blood pressure.